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Flyway protection and the predicament of our migrant birds: A critical look at international conservation policies and the Dutch Wadden Sea

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ABSTRACT

The nomination of the Dutch and German parts of the Wadden Sea as a World Heritage Site within the framework of the World Heritage Convention (WHC) represents high-level recognition of the global importance of this area for millions of migratory birds. It was not the first accolade for the unique wilderness area, but arguably the most prestigious. In its nomination, the World Heritage Convention requests the two countries to strengthen cooperation within the African–Eurasian Flyways, a system of global connectedness by migrant waterbirds in which the Wadden Sea plays a vital role. Here we review the origin and (lack of) implementation of the international conservation instruments available to protect values that are easily undervalued and forgotten, instruments that involve cooperation along the flyway axes. We describe how scientific information sometimes helps governments to implement their obligations, but also how, in spite of indisputable scientific data, governments take decisions contrary to their obligations under international conservation instruments. In some cases such decisions are reversed after scientists have shown measurable declines in the global populations of the migratory waterbirds and established the causality of such declines. At a global level, a few more regional flyway conservation instruments may be needed, but for most parts of the world the instrumentation to secure the well-being of the flyways are in place. It boils down to the determination by governments, informed by good science and under close scrutiny by NGOs, to put them into concrete action.

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1. Introduction

Whether in crypsis on the wide-ranging northern breeding areas at low densities, or inescapably visible on the few hospitable hot spots along the margins of the continents where they concentrate in large numbers during the rest of the year, migrating waterbirds are awesome. Their big flocks convey an impression of abundance and richness, and the feats of navigation and endurance exercise of the individual animals to negotiate the huge distances between the distinct areas along the flyways that offer the right ecological conditions, somehow it is all quite beyond imagination (see for an example: Gill et al., 2008). These long-distance migrant waterbirds appear particularly susceptible to the effects of human encroachment on habitats, overexploitation of resources and global climate change (see e.g.: Baker et al., 2004; Boere et al., 2006; Galbraith, 2011; Piersma and Baker, 2000), and are thus great

sentinels to inform us about the state of our global ecology (Piersma and Lindström, 2004). In any case, the waterbirds, and the wetlands they rely on, warrant conserving. This has been politically translated in measures that should restrain the human economic use of these birds and the habitats that they depend on.

This recognition, more than half a century ago, that migrating waterbirds represent an internationally shared resource that is worth preserving, has led to several international agreements and distinctions. The most recent one for the Dutch and German parts of the Wadden Sea was the nomination in June 2009 by the World Heritage Convention (WHC) as a World Heritage Site (WHC Committee Decision 33 COM 8B.4, 2009). The Danish part of the Wadden Sea has yet to be included; the Danish Government likes to first finalize the procedures and decisions to establish a National Park for the Danish part of the Wadden Sea. Indeed, the *Ministerial Council Declaration (2010)* of the three Wadden Sea countries includes the following statement: “Agree to start in the forthcoming period a possible nomination of the Danish Wadden Sea in accordance with encouragement of the World Heritage Committee.”

Recognition as a World Heritage Site once again highlighted the great importance of the Wadden Sea as an internationally shared

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coastal area for millions of migratory waterbirds. Previously, the Wadden Sea was vindicated as a Ramsar site, a Natura-2000 site, an Important Bird Area, and a Man and Biosphere Reserve. All these recognitions were based on the global importance of the area in the flyway network connecting the northern parts of the globe with coastal areas across northern and southern hemispheres. The WHC nomination therefore calls, among other issues, upon the Dutch and the German Governments, to undertake various activities (WHC, 2009) which includes the following statement: “...strengthen cooperation on management and research activities with States Parties on the African Eurasian Flyways, which play a significant role in conserving migratory species along these flyways.”

The WHC at the same time calls for an effective management, regulation and monitoring of the area in relation to possible human pressures such as recreation (including the development of a strategic plan on tourism development), fisheries, marine traffic, drainage and harbour development. Maintaining the hydrological and ecological processes is seen by the WHC as an overarching requirement for the protection and integrity of this property. The WHC also requests assurance about sufficient financial and human resources being made available for the management, research, monitoring of the values of the Wadden Sea area. These are strong obligations for the two governments, and their managing authorities involved as it includes the risk that the WHC designation will be removed if these obligations are not implemented in a proper way.

The Wadden Sea is not the first WHC nomination for a large tidal wetland. Other large coastal and/or tidal wetlands comparable with the Wadden Sea (including often similar conservation and management problems) and already with a WHC nomination include the Everglades National Park (USA), Fraser Island (Australia), Doñana National Park (Spain), Sunderbans (Bangladesh and India), the Parc National du Banc d'Arguin (Mauritania) and the iSimangaliso Wetland Park (South Africa). With the Wadden Sea, Doñana, Banc d'Arguin and iSimangaliso, the Africa-Eurasian flyways now have four WHC nominations that encourage national governments to undertake appropriate measures for the conservation and sustainable management of these key sites. The WHC nomination represents another ‘conservation stamp’. In this contribution we review this level of political recognition with reference to the science behind it, and discuss whether the international treaties are actually effective.

2. Scientific background

At the flyway level, the Wadden Sea fulfils different roles for different species (summary in van de Kam et al., 2004; van Roomen et al., 2011). Some species breed here, others occur in transit during migratory fuelling or during moult, yet others use it as their midwinter terminus. Through these birds that depend on the Wadden Sea in various ways, the Wadden Sea countries are connected to a large part of the globe: from North East Canada to Eastern Siberia at least as far as the Lena Delta, and well into Africa, coastal West-Africa in the first place, but going as far as South Africa and even beyond (Fig. 1). The Wadden Sea belongs to the world's top ten areas for migratory waterbirds, with a large number of species for which the area is of international importance (Table 1).

For the past 60 years or so there have always been scientists interested enough in the ecology of birds and the Wadden Sea to have developed and maintained a strong tradition of Wadden Sea and waterbird research (note that here we are dealing with international conservation policies even though many examples refer to the Dutch situation that we know best). This tradition has spawned exciting science (see van de Kam et al., 2004 for a sampler), but has also yielded an impetus for conservation implementation on



Fig. 1. The Wadden Sea area in the crossroads of waterbird flyways and demonstrating its key role and position for a large part of the globe.

a national scale, and later on at an international scale. The ambition for structured policies to protect waterbird flyways on a global scale, of course emphasized the African–Eurasian region in which the Wadden Sea plays such an important role. In order to place emphasis on the right issues flyway conservation has to be based on solid science, but at the same time benefits from clear and practical policies that are agreed, accepted and implemented by all countries within a flyway. The latter encourages inter-governmental consultations and the development of formal binding instruments to force countries to meet, discuss and agree upon what is needed for the conservation of an entire flyway, the species moving within it, and the habitats they rely on.

This is not a totally new way of thinking because migratory waterbirds conservation in an internationally coordinated way had started in the period 1920–1930. In 1927, at the initiative of the United Kingdom, a Conference on Migratory Wildfowl convened in London (Anonymous, 1928; Boere, 2010; Salathé, 1991). Ever since, among the migratory birds, waterbirds have played a large role in the development of flyway thinking (Hawkins et al., 1984). This is because waterbirds (waterfowl/wildfowl) are a traditionally important group of quarry species (Lampio, 1982), and sometimes considered a prime food resource. They were and are ringed in large numbers as well as hunted, so that recoveries of rings yield information on the geographically distinct corridors of seasonal movement over the globe (see Scott and Rose, 1996 for examples from Eurasia/Africa). Due to widespread and intense ringing efforts starting in the 1970s, shorebirds followed suit as the group for which comprehensive flyway information became available (Fig. 2 and summarized in Delany et al., 2009), with bird groups such as passerines (low recovery rates) and birds of prey only now catching up because of novel techniques (Webster et al., 2002).

Active policy development on coordinated research, conservation and management of waterbirds on the flyway level started in North America. The now widely accepted term ‘flyway’ for the first time was used when defining the four major migratory routes for waterbirds within North America involving Canada and the USA and later also Mexico. These four flyways have their own management authorities and a comprehensive monitoring and

Table 1

Waterbird species and populations, which occur in international important numbers (Ramsar Convention criterium) and are ecologically dependent on the resources within the Wadden Sea area. The average maximum number occurring in 1999/00–2006/07 and the percentage of the total flyway population are given. Sizes of flyway populations based on Wetlands International 2006. Bre = Breeding, non-bre = Non-breeding. (From van Roomen et al., 2011).

Species	Subspecies/population	Max. number	Percent of flyway population
Red-throated Diver	NW Europe (non-bre)	5000	2
Great Cormorant	<i>sinensis</i> , N, C Europe	25,200	6
Eurasian Spoonbill	<i>leucorodia</i> , E Atlantic	1800	16
Greylag Goose	<i>anser</i> , NW Europe (bre)	35,500	7
Barnacle Goose	N Russia, E Baltic (bre)	353,000	84
Brent Goose	<i>bernicla</i>	200,000	100
Brent Goose	<i>hrota</i> , Svalbard, N Greenland (bre)	900	13
Common Shelduck	NW Europe (bre)	246,000	82
Eurasian Wigeon	NW Europe (non-bre)	332,000	22
Common Teal	<i>crecca</i> , NW Europe (non-bre)	43,00	9
Mallard	<i>platyrhynchos</i> , NW Europe (non-bre)	156,000	3
Northern Pintail	NW Europe (non-bre)	31,700	53
Northern Shoveler	NW & C Europe (non-bre)	8100	20
Greater Scaup	<i>marila</i> , W Europe (non-bre)	28,700	9
Common Eider	<i>mollissima</i> , Baltic, Wadden Sea	249,000	33
Common Scoter	<i>nigra</i>	305,000	19
Red-breasted Merganser	NW & C Europe (non-bre)	560	0 ¹
Eurasian Oystercatcher	<i>ostralegus</i>	507,000	50
Pied Avocet	W Europe (bre)	39,000	53
Common Ringed Plover	<i>hiaticula</i>	5400	7
Common Ringed Plover	<i>psammodyroma/tundrae</i>	34,300	18
Kentish Plover	<i>alexandrinus</i> , E Atlantic, W Mediterranean	700	1
Eurasian Golden Plover	<i>apricaria</i>	?	2
Eurasian Golden Plover	<i>altifrons</i> , N Europe, extreme W Siberia (bre)	127,000	17
Grey Plover	<i>squatarola</i> , E Atlantic (non-bre)	149,000	60
Red Knot	<i>canutus</i>	358,000	105
Red Knot	<i>islandica</i>	341,000	76
Sanderling	E Atlantic (non-bre)	36,800	31
Curlew Sandpiper	W Africa (non-bre)	13,500	1
Dunlin	<i>alpina</i>	1,154,000	87
Dunlin	<i>schinzii</i> , Baltic (bre)	?	2
Bar-tailed Godwit	<i>taymyrensis</i> , W, SW Africa (non-bre)	329,000	55
Bar-tailed Godwit	<i>lapponica</i>	161,000	134
Whimbrel	<i>phaeopus</i> , NE Europe (bre)	3900	1
Eurasian Curlew	<i>arquata</i>	324,000	38
Spotted Redshank	Europe (bre)	20,500	23
Common Redshank	<i>totanus</i> Northern Europe (breeding)	84,400	34
Common Redshank	<i>robusta</i>	43,800	16
Common Greenshank	NW Europe (bre)	26,000	11
Ruddy Turnstone	<i>interpres</i> , NE Canada, Greenland (bre)	8300	6
Ruddy Turnstone	<i>interpres</i> , Fennoscandia, NW Russia (bre)	8500	10
Little Gull	N, C & E Europe (bre)	5400	4
Black-headed Gull	West & Central Europe (bre)	461,000	11
Mew Gull	<i>canus</i>	225,000	10
Lesser Black-backed Gull	<i>intermedius</i>	268,000	71
Herring Gull	<i>argentatus/argenteus</i>	194,000	7
Great Black-backed Gull	NE Atlantic	12,300	3
Sandwich Tern	<i>sandvicensis</i> , W Europe (bre)	59,600	35
Common Tern	<i>hirundo</i> , S, W Europe (bre)	23,000	12
Common Tern	<i>hirundo</i> , N, E Europe (bre)	?	2
Arctic Tern	N Eurasia (bre)	18,000	2
Little Tern	<i>albifrons</i> , W Europe (bre)	1700	3

research programme, with adaptive management administering the sustainable use of the populations (Hawkins et al., 1984; Hochbaum, 1955; Lincoln, 1950; Schmidt, 2006). Active management, i.e. detailed hunting legislation, in the first place was based on national interests. Although there was an awareness about migration crossing borders for over a century (Dixon, 1895; Wuczetiz and Tugarinov 1937), the development of international management policies for a long time was very limited.

Also in the light of the WHC request we first need a widely agreed definition of what a flyway is. Based on many forerunners, for the global flyway meeting in Edinburgh in 2004, Boere and Stroud (2006) arrived at the following definition that seems to encompass most concerns and regularly being used in publications and policy documents (UNEP/GEF, 2009): “A flyway is the entire range of a migratory bird species (or groups of related species or

distinct populations of a single species) through which it moves on an annual basis from the breeding grounds to non-breeding areas, including intermediate resting and feeding places as well as the area within which the birds migrate.” See Fig. 2 for an example of combined flyways for similar bird species, and Fig. 3 for an example of a single species flyway. It is also important to look briefly at the developments of international conservation instruments for waterbirds and flyways to see what already could have been done on conservation of its important values, before the Dutch and German Wadden Sea were designated as a World Heritage Site.

3. The development of regional and global treaties

The international coordination of flyway conservation in Europe, West Asia and Africa formally started off with the

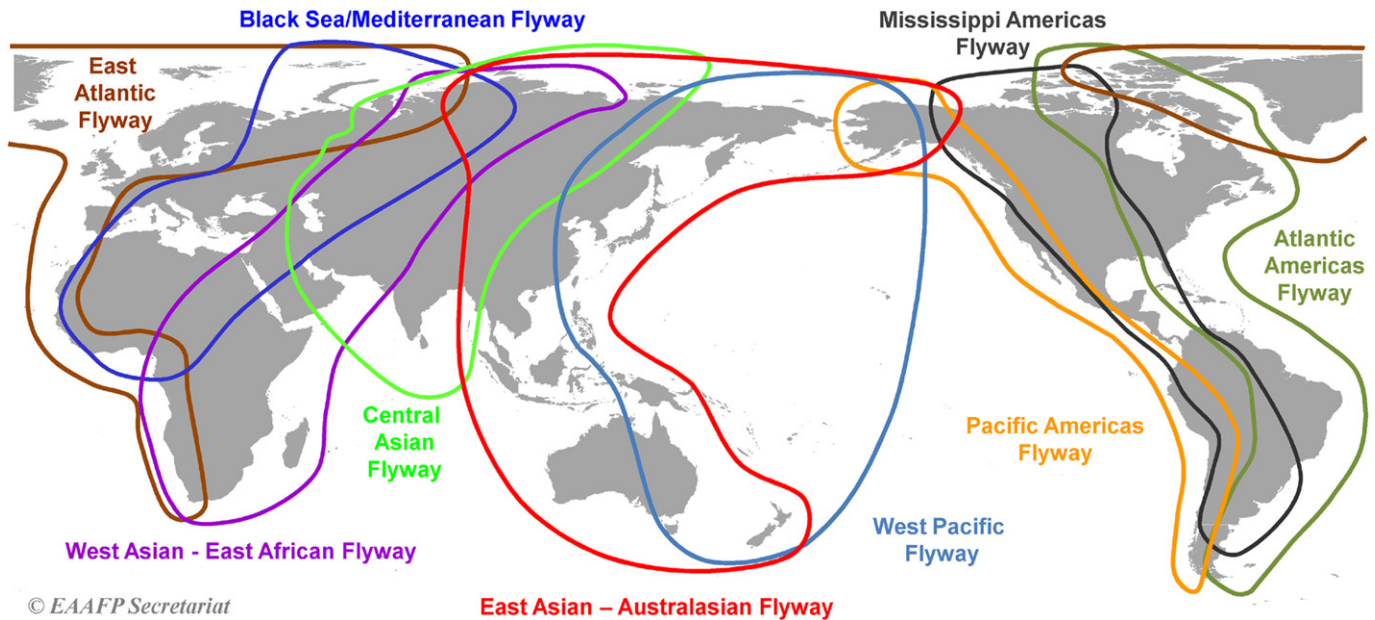


Fig. 2. Main waterbird (including shorebirds) flyways of the world. (Source: Secretariat of the East Asian–Australasian Flyway Program).

establishment of the International Waterfowl Research Bureau (IWRB) in 1949 (Hindle, 1963). Wetland habitat reduction and concerns about unregulated waterbird hunting were important issues; and actual still are in a large part of the African–Eurasian flyway. In 1995 IWRB was brought together with Wetlands for the Americas and the Asian Wetland Bureau to continue as Wetlands International. This all took shape during a series of international conferences on waterbirds, their habitats and flyways, such as Project MAR and the First European Meeting on Wildfowl Conservation in 1964 in St. Andrews (Scotland) (IUCN, 1963, 1965; Swift, 1964), later followed by conferences focused on Eurasia (Hoffmann, 1966; Isakov, 1970; Salverda, 1967; Scott and Smart,

1982), but steadily having global ambitions (Beintema & van Vessem, 1999; Birkan and WIE, 1996; Boere et al., 2006; Boyd and Pirot, 1989; Davidson and Pienkowski, 1987; Hötter and WIE, 1998; Matthews, 1990).

These activities, and the involvement of national governments, among them The Netherlands, with some degree of dedication resulted in the elaboration of the Convention on Wetlands- or Ramsar Convention, (Klemm and Creteaux, 1995; Matthews, 1993; Smart, 1976; www.ramsar.org). The Ramsar Convention has been an immense stimulus to international cooperation on wetland habitat and waterbird conservation. A next step forward was the decision at the first UN Conference on the Human Environment

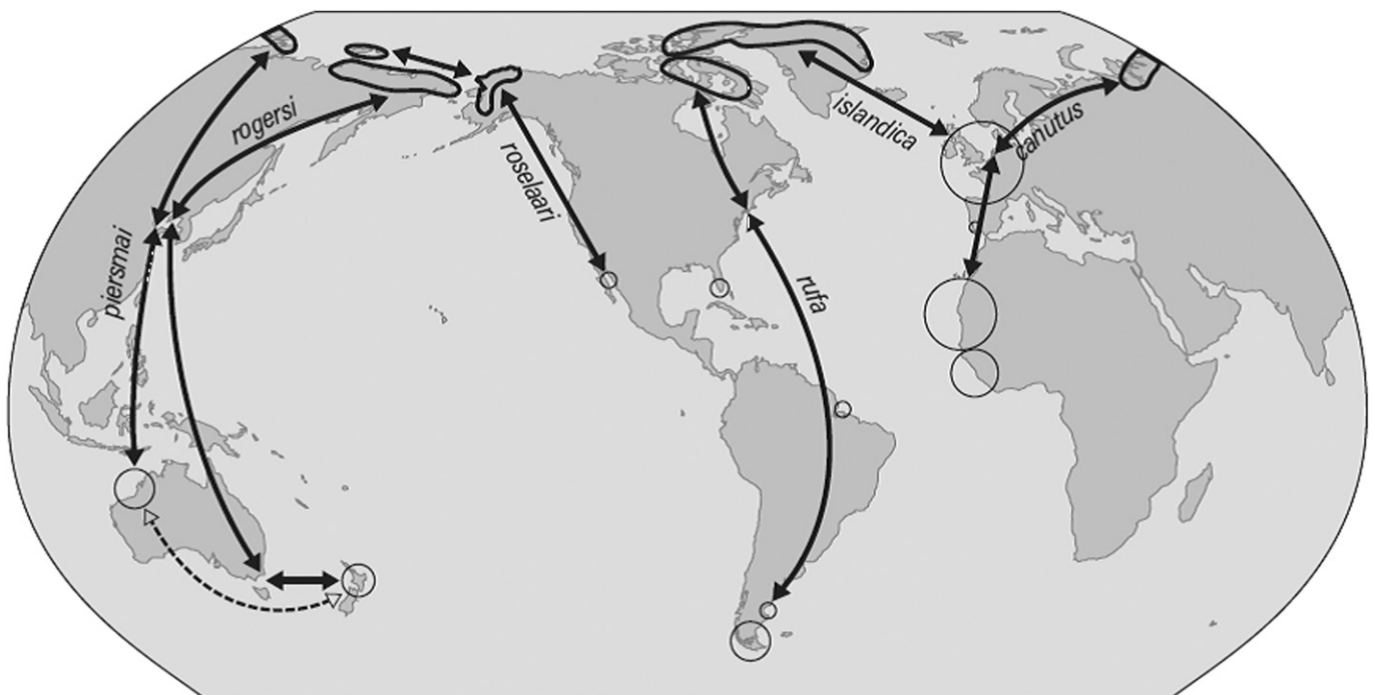


Fig. 3. Global flyway map of Red knots *Calidris canutus* showing the flyways of the six different subspecies recognized on the basis of morphological differences.

held in Stockholm in 1972 to develop a convention for the conservation of migratory species. It could legally bind governments to cooperate in the field of conservation, management and research of all migratory species, in our case migratory waterbirds on the flyway level. Clearly, the scientific information on population sizes and hunting pressures harnessed by IWRB (data collected on a volunteer basis and mainly by volunteers; we like to stress this last fact), drove a need for closer consultations between countries and providing financial support, to jointly address the identified problems. This was also necessary to meet the obligations under the Ramsar Convention to designate internationally important wetlands using the well-known criterion of sites holding 1% of a flyway population. Such designations are only possible if there is the regular monitoring of numbers at sites and, indeed, along the whole flyway. These necessary resources were not always sufficiently available by the participating governments.

The Federal Republic of Germany took the initiative to further develop a convention on migratory species which became: Convention on the Conservation of Migratory species of Wild Animals (CMS) which is now known as the Bonn Convention (Bonn, 1979), administered by UNEP and still residing in Bonn. The Bonn Convention is a *framework convention* aimed at concluding separate instruments of various legal structure for different groups of migratory species globally, or per region, or some combination (see Fig. 3 for an example of all different legal structures for migratory birds, both group of species and single species). At the first meeting of the parties (CMS/COP1) in 1985 in Bonn, Germany, at the initiative of the German and Dutch delegations the decision was taken to develop a legal structure for the international conservation and management of waterbirds, the 'Western Palearctic Anatidae Agreement' (WPAA). This agreement would focus on mainly ducks, geese and swans and was motivated by the great importance of The Netherlands and Germany for breeding, migrating and wintering waterbirds with globally important areas such as the Wadden Sea and, in the Netherlands, the Delta Region and Lake IJsselmeer. WPAA would stimulate countries to regularly meet and discuss common interests and to solve management problems, including hunting issues. Under the aegis of the Dutch Ministry of Agriculture, Nature and Fisheries (LNV), the original idea of a restricted WPAA, developed into a real flyway instrument and became, at a conference in 1995 in The Hague, the Agreement on the Conservation of African–Eurasian Migratory Waterbirds (AEWA; Boere, 1990, 1991, 2010). Currently, it is the largest flyway conservation and management instrument in the world (Fig. 4), and when it comes to conserving and managing the migratory waterbirds of the international Wadden Sea, AEWA provides the best legal inter-governmental instrument. With almost 70 ratifying countries, its own administrative budget and many organizations actively involved in its implementation, AEWA has the potential to make a big difference in the conservation of migrating waterbirds (AEWA, 2008; Boere, 2010). Its various activities include: (1) the provision of guidelines to set up monitoring of AEWA priority species and waterbirds and their habitats, (2) training courses for government staff, reserve wardens, etc., (3) the provision of up to date information on what can be done to eliminate, or at least mitigate, the negative influences of human activities on waterbird populations, (4) providing scientific summary reports and conservation guidelines on issues such as climate change, lead poisoning, diseases, crop damage and tourism, (5) the preparation of single species action plans to halt the decline of vulnerable species (Fig. 5).

Unlike the EU Bird Directive discussed below, AEWA (and the Bonn Convention in general, but also the Ramsar Convention) cannot impose and/or enforce measures on governments, not even in situations where scientific data indisputably prove the issues negatively affecting habitats and populations in decline. This means that

countries easily get away with breaching the general rules of AEWA, even if they are a formal party. An example for The Netherlands was the draft decision in 2011 to add White-fronted Goose *Anser albifrons*, and Wigeon *Anas penelope* to the list of huntable species. This decision was not communicated with the AEWA Secretariat. Although strictly speaking not a formal obligation to do so, it could mean that populations cannot maintain their favourable conservation status if no consultation takes place with other AEWA parties hunting the same species. Such consultations would at least have been within 'the spirit' of what AEWA was developed for.

At the European level two legal instruments help the conservation of migratory birds. (1) The Convention on the Conservation of European Wildlife and Natural Habitats, or Bern Convention (1979). The Bern Convention has a special Annex with a large list of migratory birds in need of protection. This Annex provides an opportunity for African countries to become a Party to the Bern Convention. (2) The EU Birds Directive, also from 1979, is a strong instrument in protecting migratory birds and their habitats and flyways as it represents supra-national legislation and is more powerful than most multilateral instruments. The EU Commission has the power to bring EU Member States to the European Court in Luxembourg and can apply a system of serious fines and/or withdrawal of funding opportunities. The Netherlands has experienced this in a case of conflict about cockle dredging in the Wadden Sea, a destructive fishing practice that caused serious declines in several shorebird populations (Camphuysen et al., 2002; Swart & van Andel, 2008; van Gils et al., 2006b). In this case, the Dutch High Court (Raad van State) only started to rule against the cockle dredging permits issued by the Dutch government after the European Court, in 2003, had ruled against them.

There are several other legally binding multilateral agreements which in principle could have a positive impact on migratory waterbirds, but for which migratory waterbirds are not the top priority. The Convention on Biodiversity (CBD), the Framework Convention on Climate Change (FCCC) and the Framework Convention on Combating Desertification (FCCD) are all dealing with what is most important for migratory species: the conservation of their wetland habitats within entire flyways. The availability of the right number and quality of 'stepping stones' from the breeding areas to the non-breeding areas is essential (van de Kam et al., 2004), and these larger and politically more influential treaties could make a difference if habitat conservation within a flyway would be an important part of their work programme. However, politics rather than science seem to determine their agendas and the conservation of migratory species is in fact 'delegated' to the Bonn Convention.

Other multilateral, but not legally binding, 'agreements' are often based on a common strategy agreed among participating countries and other stakeholders, often national and international bird conservation NGOs (Boere and Clayton 2002; Boere, 2003; Schmidt, 2006). A good example for waterbird conservation is the East Asian–Australasian Migratory Bird Conservation Strategy implemented for the Asia-Pacific Flyway (see e.g. Mundkur, 2006; van Vessum, 1997). A second is the Western Hemisphere Shorebird Reserve Network (WHSRN). A third is the Action Plan available for the Central Asian Flyway (CAF/CMS, 2005), but so far the political situation within the latter region has not allowed it to be developed further.

4. Flyway conservation efforts in the new millennium

In April 2004 an international conference called 'Waterbirds Around the World' was held in Edinburgh with the aim to lift the status of migrating waterbird conservation on scientific and political agendas, also in the light of existing international instruments

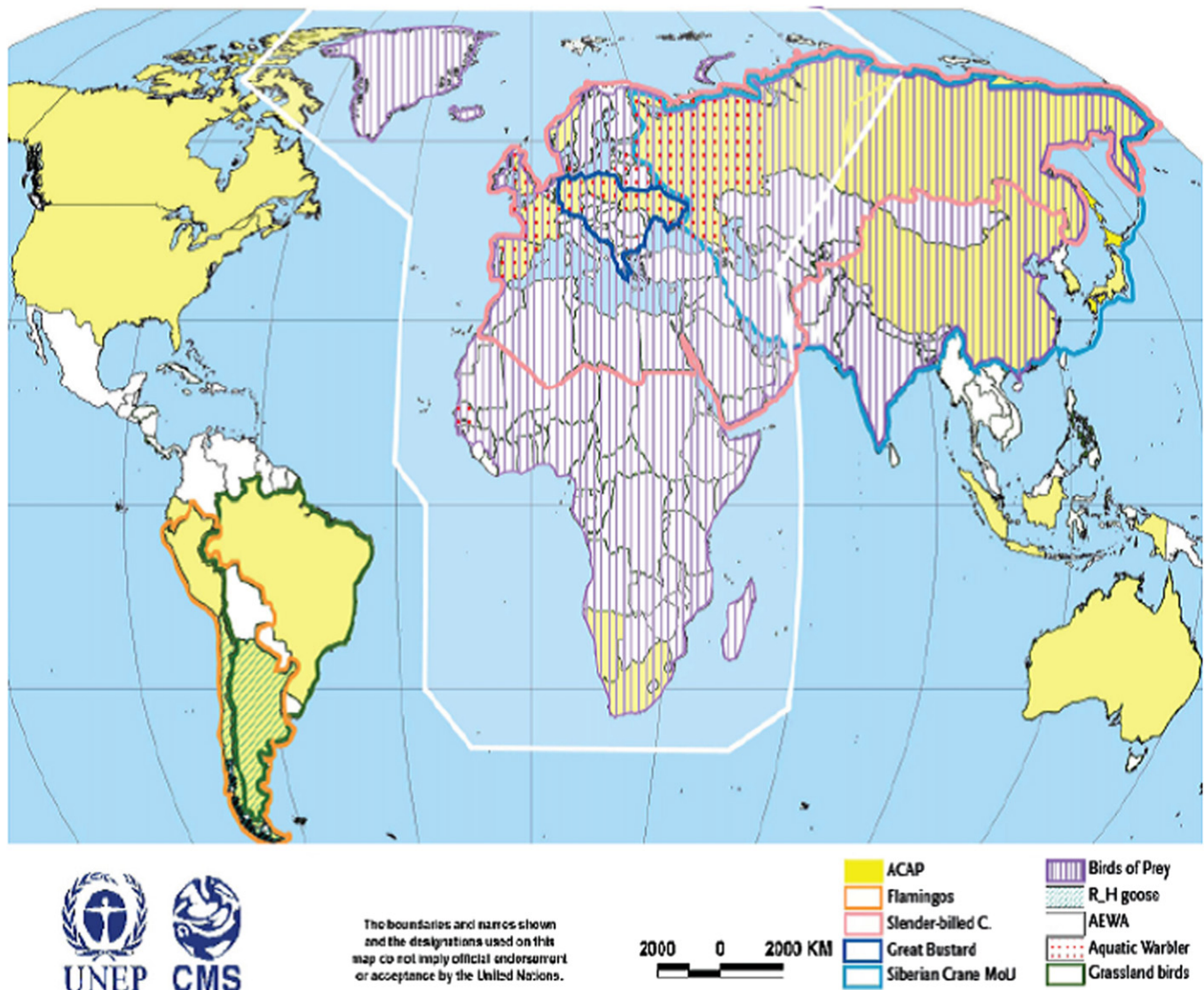


Fig. 4. Map with present various legal arrangements under CMS for migratory birds showing the great variation in both species and regions. ACAP: Agreement on the Conservation of Albatrosses and Petrels; Slender-billed C: Slender-billed Curlew; R_H goose: Ruddy-headed Goose; AEWA: see text. (Source: Taej Mundkur presentation at CMS/COP 10, November 2011).

providing good opportunities for countries to work together. With almost 500 participants from 90 countries, three ministers at the opening session, and a strong conservation statement on migratory bird conservation with an emphasis on albatrosses from HRH the Prince of Wales, the conference did well. It adopted the Edinburgh Declaration (Boere et al., 2006) which formulated priorities for flyway conservation and research and for international policy development. It being based on a scientific rather than a formal inter-governmental meeting, the Edinburgh declaration is not a binding instrument for countries. Nevertheless, the Ramsar Convention Parties in 2008 in the Republic of Korea adopted Resolution X/22 'Promoting international cooperation for the conservation of waterbird flyways', with the Edinburgh Declaration as a formal Annex. The Bonn Convention Parties did the same at their meeting (2008 in Rome; Resolution 9.2 'Priorities for CMS Agreements'). It is encouraging that both international conservation treaties accepted the Edinburgh Declaration as an obligation. In practice, however, it will act more as a guidance document.

The results of work on further global flyway policies and actions by CMS were presented in November 2011 at the CMS/COP 10

(Galbraith, 2011; Jones and Mundkur, 2010; UNEP/CMS, 2009). An important conclusion was that globally a good number of flyway conservation policy instruments are already available, but that for Central Asia and the Central Pacific new instruments are still needed. With enough legal instruments, there is now a strong need for actions in the field. A good start was the Wings Over Wetlands project for the AEWA region (details of the project and its funding are found at www.wingsoverwetlands.org/). WOW, aimed at also bringing scientific information together for all those involved in migratory birds conservation, including responsible governments (WOW, 2009). In this context, the 'Flyway Training Kit' (FTK) was developed by Dodman and Boere (2010). This 'kit', summarizing a great amount of scientific information and literature, is now available in English, French and Russian, with an Arabic version in the making. Encouragingly, some African wildlife institutes and universities have made the FTK part of their training.

Another important WOW product was the Critical Site Network, an online resource on the conservation of 294 waterbird species, and with data of more than 3000 sites upon which they depend in Africa and Eurasia. It combines detailed information from four

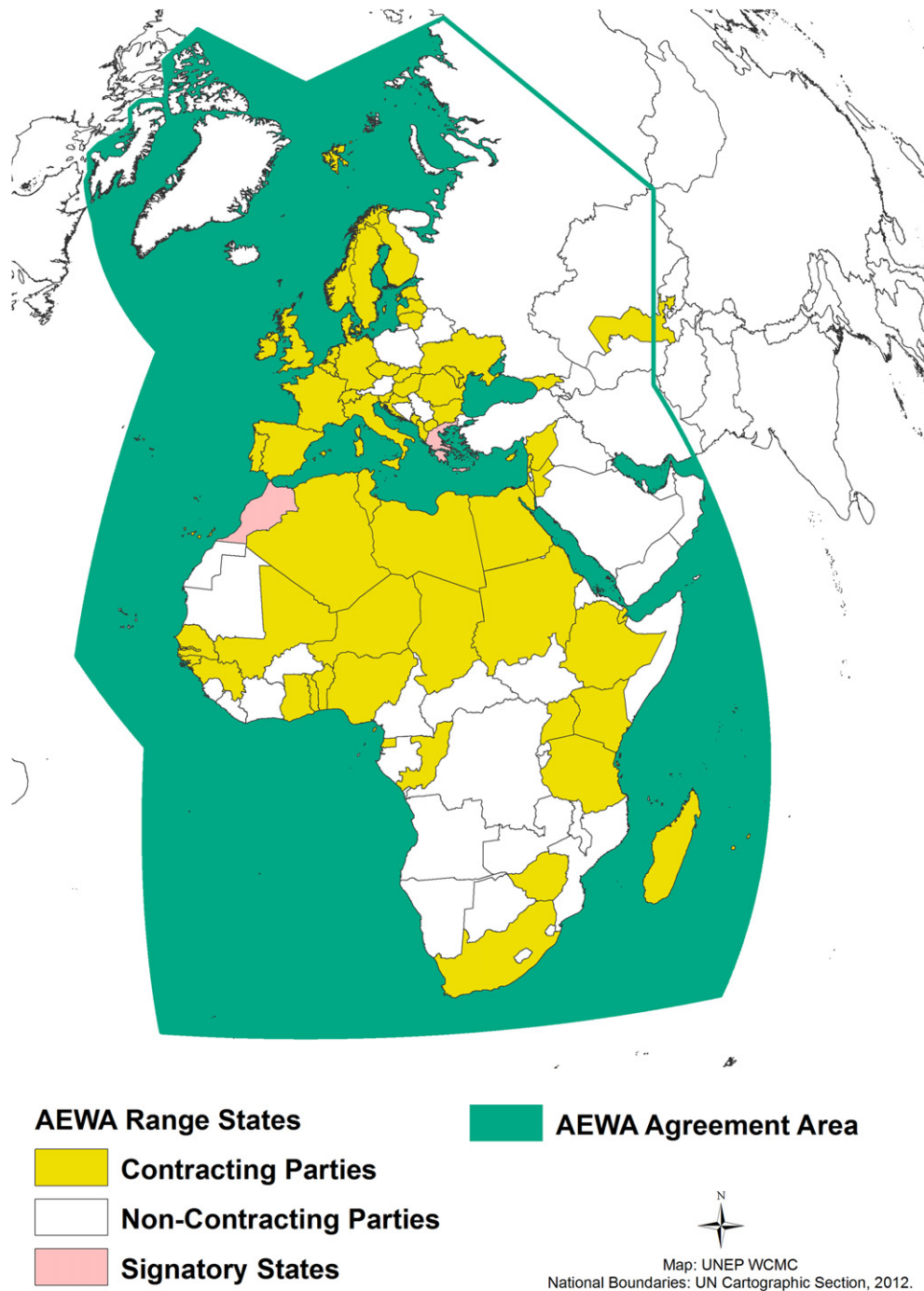


Fig. 5. Map of the AEWA region with countries presently participating. (Source AEWA, May 2012).

important data bases; which are updated as much as possible (WOW, 2011). With this tool, a large amount of monitoring and ecological data becomes available in an integrated way for decision making on a flyway level and should be used for conservation action!

5. In the meantime, what happened to the waterbirds of the world?

Clearly, over the last decades there have been many expressions, at various levels of (inter) -national governance, of concern for the conservation of migrant waterbirds and the wetlands that they

depend on. Yet, in 2003 the international Wader Study Group showed that globally of 207 shorebird populations with known population trajectories (out of a total of 511 known shorebird populations), almost half (48%) are now known to be in decline, whereas only 16% are increasing (International Wader Study Group, 2003); van Roomen et al. (2012) show similar figures for the Wadden Sea. With three times as many populations in decline rather than increase, shorebirds belong to the most globally endangered segment of the migrant birds of the world (Piersma, 2007). For example, an emblematic migrating waterbird species such as the Black-tailed Godwit *Limosa limosa limosa* for which The Netherlands, surely one of the driving countries on the waterbird

convention front, carries international responsibility for hosting over 60% of the flyway breeding population, continued to be in decline with 5–10% per year (Thorup, 2006). Black-tailed Godwits rely on land managed for dairy farming, and the economic concerns of this industry, despite a lot of national policy-making for the so-called meadow birds, have always been given preference over the concern for biodiversity (Roodbergen et al., 2008; Schekkerman and Müskens, 2000); basically breaching with AEWA and other agreements by not maintaining populations in a 'favourable conservation status or restore them' as is one of the fundamental principles of AEWA (Article II). Similarly, on a more local scale the industrial scale of mechanical dredging for cockles in the Dutch Wadden Sea directly negatively affected the flyway populations of several waterbirds (as detailed below).

These cases from The Netherlands mirror the situation of migrating shorebird elsewhere in the world. A recent analysis of N.C. Davidson and D.A. Stroud (pers. comm.) shows the numbers of birds to be in steady decline along all of the world's flyways; the same with a great number of migratory land- and (other) waterbirds on a flyway level; see Kirby et al. (2008) and Kirby (2010) for an overview of major threats and recommendations. Indeed, although reclamation activities have now ceased in northwest Europe (Piersma, 2009), the turning of intertidal flats into fish- or salt ponds, agricultural, recreational and industrial land has accelerated in, for instance, eastern Asia (but also Africa and South America), especially in the Yellow Sea region, to accommodate the pressure of increasing human populations and economic growth (Barter, 2002; Cao et al., 2009; Moores, 2006; van de Kam et al., 2008). It is here that the populations of migrating waterbirds, especially those that depend on coastal wetlands, have shown the sharpest declines in parallel with the losses of intertidal areas, in the extreme leading to threatened or nearly extinct populations (Amano et al., 2010; Moores et al., 2008; Syroechkovskiy, 2004; Zöckler et al., 2010). A dramatic case in point is the coast of Bohai Bay in the northwest of the Yellow Sea where, between 1994 and 2010, a total of 450 km² of offshore area, including 218 km² of intertidal flats (one third of the original tidal area in the bay), was claimed for two industrial projects (Yang et al., 2011). So far this has caused the northward migrants to become concentrated in the ever smaller remaining area, which in spring 2010 held 62% of the total known world populations of the two Red Knot subspecies migrating along the East Asia-Australasian Flyway, *Calidris canutus piersmai* and *C. c. rogersi* (Rogers et al., 2010).

Within the AEWA region, gas and oil developments and increased intensive fisheries near Banc d'Arguin, Mauritania, are a serious threat (Zeeberg et al., 2006) and not at all eliminated. Banc d'Arguin is a WHC-nominated site and its designation has certainly helped to stimulate governments and international organisations to provide essential funding to protect the integrity of the site. An example is the recent decision of GEF to provide substantial funding for a project to assure that marine and coastal biodiversity is taken into account in possible oil and gas developments; matching funds are provided by e.g. the German Agency for International Cooperation (GIZ) and also IUCN and WWF are involved (GEF, 2012). The AEWA Secretariat never reacted to a letter (2005) from the first author addressing the potential problems of increased fishing, bivalve harvesting etc. for migratory birds wintering on the Banc d'Arguin, nor did the Dutch Ministry of LNV (now named Ministry of Economic Affairs, Agriculture and Innovation or 'ELI').

Another case in point are the sub-Saharan wetlands, subject to a detailed analysis by Zwarts et al. (2010). The damming of seasonal rivers for power generation and irrigation, the surging numbers of livestock to accommodate a surging human population, in interaction with periodic droughts, have combined to a difficult situation with both water- and landbirds in the main wintering areas

south of the Sahara. For many waterbirds and passerine landbirds Zwarts et al. (2010) show how this has contributed to the downward trends in breeding populations in Europe.

6. Trilateral Wadden Sea cooperation

A final case is provided by the main coastal wetland in north-west Europe, the international Wadden Sea for which conservation and sustainable management The Netherlands, Germany and Denmark have a joint responsibility. The three countries established the Trilateral Governmental Conference in order to create a platform for good coordination and policy development. Note that this is not a formal legally binding arrangement such as CMS, CBD or AEWA, but it has achieved a number of good conservation results. The Common Wadden Sea Secretariat (CWSS) is responsible for the implementation of the decisions by the Trilateral Ministerial Conferences and coordinates and stimulates joint monitoring activities, status reports on flora and fauna, environmental status reports, regular conferences on scientific research and many more. The Trilateral Monitoring and Assessment Programme (TMAP) is actually a very comprehensive one for such a large area, and includes not only birds but also mammals, invasive species, eutrophication, fish, etc. All these data are analysed and reviewed which leads to the Quality Status Reports (QSR's), regularly published by the CWSS and describing the conservation status of the whole international Wadden Sea; the last one was published in 2009. Based partly on TMAP data, the trilateral cooperation has contributed to conservation actions in favour of birds such as the ban on hunting in the Danish Wadden Sea and mussel fishery plan for part of the German Wadden Sea (see CWSS website for more detailed information; published reports, on-going projects). Clearly, the intensive trilateral cooperation, the relative good monitoring systems, the regular evaluations in the QSR and the various national legal conservation measures, have contributed to the WHC nomination.

On a national scale the intertidal flats of the Dutch Wadden Sea are a National Nature Monument, and are protected under the Ramsar Convention and EU's Habitat and Birds Directives (Reneerkens et al., 2005). Despite the high-level conservation status and widespread scientific concerns about the damaging effects of shellfish-dredging to marine benthic ecosystems, until 2004 three-quarters of the intertidal flats of the Dutch Wadden Sea were open to mechanical dredging for edible cockles (*Cerastoderma edule*). A direct, immediate effect of dredging was the complete removal of all organisms larger than 19 mm in the 5-cm top layer. As the dredged sites are usually the most biodiverse (Kraan et al., 2007), dredging may also affect smaller cockles and other bivalves. More indirectly, and over longer time scales, sediments lose fine silts during dredging events, and this leads to long-term reductions in settlement success in both cockles and Baltic tellins (Hiddink, 2003; Piersma et al., 2001). Between the winters of 1997/1998 and of 2002/2003 the numbers of wintering Red Knots *Calidris canutus islandica* in NW-Europe declined by about 25% (from c. 330,000 to c. 250,000), and the numbers in the Dutch Wadden Sea by some 80%, from a level of ca. 100,000 to 20,000 or fewer (van Roomen et al., 2005).

In dredged areas densities of cockle spat remained stable, whereas densities increased by a marginal amount (2.6%) per year in undredged areas (van Gils et al., 2006b). In addition, the quality of cockle spat declined by 11.3% per year in dredged areas and remained stable in undredged areas. In the Wadden Sea only a limited part of the available intertidal flats is rich enough in suitable prey to be of any use to foraging red knots in the best of years (Piersma et al., 1995; van Gils et al., 2006a). However, from 1998 to 2002 the percentage of 1-km²-blocks that were too poor for

Red Knots to obtain a threshold intake rate increased from 66% to 87% (van Gils et al., 2006b). This loss was entirely due to an increase in previously suitable blocks that were dredged; the number of previously unsuitable (and undredged) blocks did not increase. As a consequence of the widespread dredging in the most biodiverse areas of intertidal flat (Kraan et al. 2007), Red Knots declined in equal proportion to the loss of suitable intertidal area (Kraan et al., 2009). We must thus conclude that the industrial forms of commercial exploitation allowed by the Dutch government in one of its best legally protected nature reserves has been directly responsible for the population decline of an, also fully protected, long-distance migrant shorebird species. Precisely the same conclusion has been reached by studies on the decline of another fully protected shellfish-eating shorebird, the Eurasian oystercatcher *Haematopus ostralegus* in the Dutch Wadden Sea (Verhulst et al., 2004) and a nearby UK estuary (Atkinson et al., 2003), and for a strictly molluscivore seaduck, the common eider *Somateria mollissima* (Camphuysen et al., 2002).

7. Pressing concerns and scientific data in relation to government action

The various examples show that in spite of obligations by, in two cases, the Dutch government under various, above listed, international conservation treaties (some of which had been developed with the strong support of that same government), short-term economic and political reasons prevailed whilst scientific data were neglected. A critical case with respect to the Wadden Sea is provided by the issue of mechanical cockle dredging in the Dutch Wadden Sea (Swart & van Andel, 2008). Obeying a decree of the European Court that mechanical dredging for cockles is a new economic activity that has to be evaluated in the context the EU Habitat and Birds Directives and at the request of Vogelbescherming-Nederland/Birdlife Netherlands, the ruling of the high Netherlands Court (Raad van State) destroyed the existing governmental permits for mechanical cockle dredging issued by the Dutch Ministry for Agriculture, Nature Conservation and Food Quality. This forced the Ministry to close the mechanical forms of cockle dredging from 2004 onward, the international companies affected receiving a generous compensation sum of 128 million Euro. Although this may have meant the end of industrial dredging for cockles in the Dutch Wadden Sea, since 2004 the Ministry has issued new permits for mechanical dredging for lugworms and worked towards an increase in the number of permits for hand-cocklers (van Leeuwe et al., 2008).

It seems that governments, probably under pressure from short-term economic and political interests, have been quite unwilling to learn from the 'cockle case'. Even in the Wadden Sea, conservation science has to prove what the (almost predictable) long-term negative effects of on-going economic exploitation will be on the habitats of concern and the waterbird populations that depend on them (van Roomen et al., 2011). It again could mean breaching of various treaties The Netherlands has signed for, notably the Ramsar- and Bonn Conventions, but also now the World Heritage Convention with its specific strong requirements mentioned before, such as : '*maintaining the hydrological and ecological processes is seen by the WHC as an overarching requirement for the protection and integrity of this property*'. It is disappointing that governments very often fail to apply the precautionary principle, even if it is laid down in almost all conventions either in the text or in later adopted resolutions (Boere, 2007). The precautionary principle would mean that governments should first show that a certain economic activity, or human activity in general, does not substantially influence habitats and bird populations before issuing permits for that activity. This should certainly have been applied in

cases of new permits for exploitation of Wadden Sea resources when the area already had, for a long time, the status of Ramsar Site, but is now of even greater political urge with the WHC nomination. Baakman (2011) in using a system with ten elements to test the effectiveness of biodiversity-related conventions (WHC, CBD, Ramsar, CMS and CITES) concluded that none of them were really effective on all elements (but certainly on some of them), with WHC showing the best results.

Most international conservation treaties have a mechanism to bring scientific data into the decision-making process by governments. In the case of the Bonn Convention this is the responsibility of the Scientific Council for which each party can nominate a delegate. However with a growing convention this can become a large body, for CMS it is a body with over 130 members. This is really too big for in-depth discussions on scientific issues. Moreover, many parties are often not represented by an independent scientist, but rather the person who also represents the party in the convention meeting itself. This creates a risk that an advice of the Scientific Council is already 'watered down' before it comes into the decision-making body. AEWA has a much smaller Technical Committee with regional representation, which provides a better starting point for discussions on scientific data underpinning the decision-making process.

It remains to the participating governments to do something with scientific evidence. Sometimes governments respond. For example, on the overwhelming evidence published by Zwarts et al. (2010) on the fate of migrant waterbirds in the Sahel region of West-Africa, Birdlife International took the lead in presenting a document 'Migratory landbirds in the African–Eurasian region' (CMS/COP 10, November 2011) describing the complex problems (research, local population needs etc.) in relation to sustainable use and management. A resolution was accepted, an Action Plan in preparation and the Swiss Government promised to provide the funding for a workshop to discuss the draft Action Plan and conservation actions to be taken. However in the meantime NGO organisations had already taken action on the ground! (See project 'Living on the Edge' of the Vogelbescherming/The Netherlands and partners; http://www.vogelbescherming.nl/vogels_beschermen/internationaal/living_on_the_edge.)

8. Concluding remarks

Already over almost a century there has been international cooperation on waterbirds conservation and management. From the late 1950s this cooperation was intensified, with a few countries and organizations taking the lead and stimulating the cooperation. This cooperation was even quite intense across the former political barriers within Eurasia. The people involved in those days were convinced that to continue conservation necessitates formal arrangements between governments, i.e. the international treaties discussed above were needed (Matthews, 1990; Boere, 2010). Unfortunately, treaties themselves do not necessarily achieve actions and conservation (certainly not if no sanctions are included), but these are basically the tools for governments and non-government organisations to meet and talk to each other on a regular basis and agree on what is needed to achieve certain conservation goals. They help us to incite comments, in a diplomatic way, on issues not in line which what countries have signed for when acceding to a convention (Boere, 2007). Such sending of messages with reference to the obligations under e.g. the Ramsar or Bonn Conventions is something that could have been done more in the past. Finally, obligations under treaties are often the legal tools to provide funding for conservation projects either direct to a country or via an Intergovernmental Organisation (IGO) such as UNEP or NGOs such as BirdLife International and Wetlands International.

In achieving the aims and goals of treaties NGO's, independent institutes and determined scientists play very often a decisive role as has been shown in many cases. Some larger (international) NGO's have their science departments and with the results of research they can call upon governments to meet their obligations. It is a good example of what was once called by the first author 'the Convention Paradox': conventions are arranged by governments, but without the critical pressure of NGOs the conventions would rarely work in practice. With the Netherlands' political wish to decentralize conservation policies to the provinces, including financial resourcing, it is very important that regional authorities involved in the Wadden Sea, are aware of their responsibilities as laid down in various international treaties and the consequences of the WHC nomination. That means they should also act in line with these responsibilities, including the provision of essential funding on an international flyway level.

However, we do not believe that such a decentralisation will work to meet international obligations and implement international treaties in the right way. The political 'downgrading' of the Directorate for Nature Conservation (including its international conservation division) to a level low within a Ministry for Economic Affairs, Agriculture and Innovation is internationally not understood. As we write, in summer 2012, the Netherlands Government lost its respected leading role on international bird conservation which it had maintained for over more than three decades. This was very visible during many bilateral discussions at the 5th Meeting of the Parties to AEWA (La Rochelle, May 2012).

The call of the World Heritage Convention on the governments of The Netherlands and Germany to become more active in the African Eurasian Flyways should stimulate the two countries (with in a later stage the Danish Government as well) to once more be actively and determinate to address the many policy and science challenges ahead, as summarized in Boere (2011) and Boere and van Roomen (2011) and formulated by the WHC in their nomination, in a truly international context.

This would mean the following: (1) Stimulating in-depth research on the consequences of large scale activities in one area on flyway populations and its long-term effect on other areas used by these same flyway populations; (2) Development and implementation of an integrated monitoring programme in the whole flyway, including ecological aspects to measure population sizes (breeding success, mortality rates, dispersion etc.) to be able to signal in an early stage if populations decline towards unfavourable conservation status; (3) Implementation of an integrated Training and Capacity Building Programme for the whole flyway for all levels of responsibility; and (4) Improvement of site management and wise use while working closely with local communities.

In the meantime the Dutch and German governments have agreed to provide some resources for various programmes to meet the WHC obligation concerning international cooperation on the flyway level. This includes a long-term fundamental research on a few selected species (project Metawad1) funded by the Dutch Wadden Sea Fund (albeit after considerable debate and serious defence by the Wadden Sea NGOs). Funding for a monitoring programme is still pending. A Training and Capacity building programme will be funded by the German Government (BMU). It must be mentioned that NGO's such as BirdLife International and Wetlands International, with private funding from the MAVA foundation, already have started a project on conservation and training in West African countries in line with what the WHC would like to take place.

The WHC has the power to withdraw the designation if the obligations are not implemented and no or insufficient attention is paid to the specific requests such as more international cooperation, ensuring the integrity and ecological requirements of the area,

etc. As we have shown above, with the additional power of a WHC nomination, there are enough international policy frameworks to force governments within the flyway to work together and supply resources for flyway conservation. It is time for more 'action' (in the broadest sense of the word). Indeed, it would be an absolute embarrassment for the Dutch and German Governments if the nomination, for whatever reason, would be withdrawn.

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